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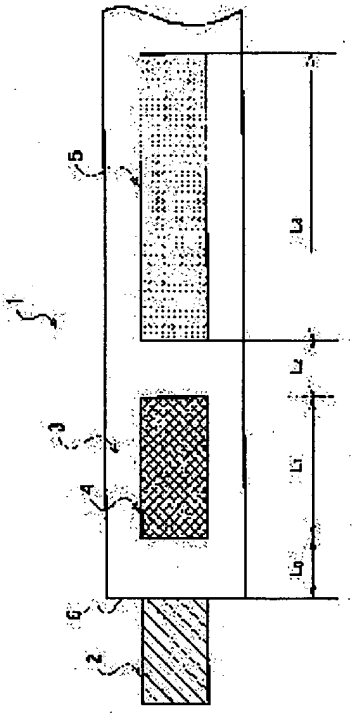
(54) COVERED ELECTRIC WIRE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a covered electric wire with high color discrimination capability discriminating color even if an electric wire is thin.

SOLUTION: Discriminating marks 4, 5 comprising rectangles having different colors and sizes are intermittently printed over the whole electric wire by a color different from a ground color of a covered part 3 in the axial direction of the covered part 3 of the covered electric wire 1 to form a state enveloped with a color having low chroma, and thereby, the discrimination capability of the electric wire is enhanced. By applying the discrimination marks to the outer circumference of the electric wire at equal intervals, the electric wire is easily discriminated even from any direction.



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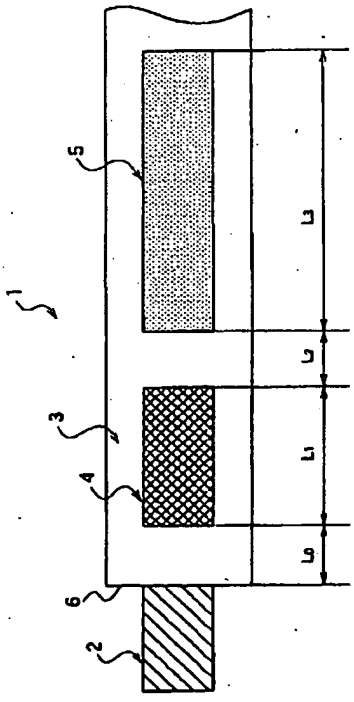
(54)【発明の名称】　被覆電線

(57)【要約】
【課題】　電線が細くても識別可能な色識別性に優れた被覆電線を提供する。
【解決手段】　本発明は、被覆電線１の被覆部３の軸方向に、被覆部３の地色と色彩の異なる色で、かつ互いに色と大きさの異なる矩形からなる識別マーク４、５を電線全体に断続的に印刷し、彩度の低い色に囲まれた状態にすることで、電線の識別性を向上させる。また、識別マークを、電線外周に等間隔の位置で付与することで、どの方向からでも容易に電線を識別することができる。



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【特許請求の範囲】

【請求項１】　電気回路接続用ワイヤーハーネスを構成する被覆電線において、電線識別情報を識別可能で、被覆電線の軸方向に沿う地色と色彩の異なる複数色の識別マークを、電線端末を起点として表示間隔が一定で、かつ断続的に配列させたことを特徴とする被覆電線。

【請求項２】　請求項１に記載の被覆電線であって、前記識別マークが大きさの異なる複数種の矩形からなり、前記識別マークの組み合わせとその配列順により電線種を識別することを特徴とする被覆電線。

【請求項３】　請求項１又は２に記載の被覆電線であって、複数の前記識別マークを電線外周に等間隔の位置で付与することを特徴とする被覆電線。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、ワイヤーハーネス等に使用する被覆電線の電線サイズ及び、電線種を識別するための識別マークを付与した被覆電線に関する。

【０００２】

【従来の技術】これまでワイヤーハーネスを構成する各絶縁被覆電線には、電装品と接続する際に、各電気回路に対応する電線を識別するために目印が施されていた。目印を施す方法として、①各電線毎に色を変えて目印とする方法。②図３に示す特開平７－２５４３１３公報等に記載の被覆電線のように、各電線にマーキングチューブあるいはマーキングテープ等を取り付けて目印とする方法。③回路名や回路番号をマーキング装置を用いて文字や数字で直接、各電線に印字する方法、等が提案されている。このような目印によって、電線種別や電線サイズを認識していた。

【０００３】上記した電線の識別方法では、以下に示す問題がある。①に示す、各電線毎に色を変えて目印とする場合、各回路に対し被覆材の色の異なる電線を用意しなければならない。このため、回路が増加すると電線の種類も増加し、製造ラインにおいて、製造用部材及び、被覆材の色の異なる電線を待機させておくためのスペースが増えるので、管理コストが増大する一因となる。

【０００４】次に、②に示す、各電線にマーキングチューブあるいはマーキングテープ等を取り付けて目印とする場合、マーキングチューブやテープ等の部材が必要となり、製品のコストアップに繋がる。また、電気回路接続用ワイヤーハーネスは各種太さの電線が使用されているが、軽量化の目的で電線は細径化される傾向にあるため、特に0.5sq未満の電線が多く用いられている。この場合、回路識別用に２、３種の色を用いているが、細径化に伴って視認性が低下し、色の組み合わせによっては識別性が極端に低下し、誤認識や誤組み付けが起こりやすくなる。

【０００５】更に、③に示す回路名や回路番号をマーキング装置を用いて文字や数字で直接各電線に印字する場合、電線自体が高速で製造されるため、各電線が電線押さえロール等の振動で揺れ、印字の一部が電線から外れると、文字や数字が不完全な形で印字されるので、読み取り不能となり、識別ミスの原因となる。以上示したような問題は、配線作業効率の低下に繋がり、作業コストの増大を招く。

【０００６】そこで、特開平１１－２７８１７公報に記載のワイヤーハーネスでは、既存のマーキング装置を用い、製作費を増大させることなく、回路の識別が正確に行える簡易なマーキング仕様を提供することを目的とした識別方法が提案されている。公報に記載の図１（ａ）に示すように、公報の識別方法は、各電線を横切る方向に、単位の図形として所定の幅の帯１をマーキングし、その帯１に単位の数値として「１」を対応させ、その帯１の数によって算出される数値に回路番号を対応させている。

【０００７】この識別方法では、大きい数値を表す場合は、前記「１」を示す細い帯１より太い帯１１に単位の数値として「５」を対応させ、この太い帯１１と細い帯１を組み合わせて数字を示す。単位の図形としては、「帯」に限らず、図１（ｂ）に示すように「黒丸」２等簡略なものにすることで、印字の際、機械振動等により電線が揺れて印字がずれ、個々の記号のマーキングが不完全に行われても、通常の数字や文字そのもののように、完全に印字しなければ意味のわからない場合と異なり、その図形形状の認識と個数の把握ができる。また、図形は小さくマーキングできるので、図形の個数や配列順によって、各回路に対応させたワイヤーハーネスを識別できる。

【０００８】この発明では、単純な形状の図形をマーキングし、その個数で各電線を識別するため、通常の数字や文字等のように、それ自体を明確に認識する必要があり、そのためにマーキングを精密に行う必要がない。また、回路毎に色の異なる電線を使用する必要がなく、全ての電線に共通の色の電線を使用できる。

【０００９】

【発明が解決しようとする課題】しかし、0.5sq未満の細い電線の場合、マーキングが一色だと視認しにくいため識別が困難である。また図形のマーキングの個数で電線を識別するため、マーキングの箇所を接続部であるコネクタの近傍等、最初の表示位置及びマークの形状を特定しなければならない。また、ワイヤーハーネスの電線部が長かったり、枝分かれ等で形状が複雑な場合、電線の長さ方向中間部にもマーキングしたとしても、電線が途中でねじれたり切れ、その箇所がマーキングの途中だった場合は、その電線の識別は困難となる。従って、各電線の情報の視認性は損なわれる可能性がある。

【００１０】そこで、本発明は、電線が細くても容易に識別でき、電線の組み立て、配線等の作業性を向上させる被覆電線の提供を目的とする。

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【００１１】
【課題を解決するための手段】上記目的を達成するため請求項１記載の発明は、電気回路接続用ワイヤーハーネスを構成する被覆電線において、電線識別情報を識別可能で、被覆電線の軸方向に沿う地色と色彩の異なる複数色の識別マークを、電線端末を起点として表示間隔が一定で、かつ断続的に配列させたことを特徴とする。
【００１２】この被覆電線では、電線地色を例えば無色又は明度が高く彩度の低い白色、灰色等を用いることで、識別マークを際だたせることができる。また、電線地色を識別マークの間に必ず配置することで、識別マークは彩度の低い色に囲まれた状態となり、識別マーク自体が際立ち、識別性が向上する。更に、識別マークの色の組み合わせの選択は、互いを目立たせるような色とし、例えば、補色関係にある色を選択することで更に識別性が向上する。また、識別マークの表示間隔を一定にし、断続的に配列させることで、識別マークの表示位置間隔が統一され、その結果、電線のどの位置からでも電線サイズや電線種を視認でき、また、電線の起点を揃える必要がない。
【００１３】請求項２記載の発明は、請求項１に記載の被覆電線であって、前記識別マークが大きさの異なる複数種の矩形からなり、前記識別マークの形状の組み合わせとその配列順により電線種を識別できることを特徴とする。
【００１４】この被覆電線では、前記識別マークの大きさを変える事で、どちらか一方もしくは全ての識別マークを際立たせることができるため、識別性が向上する。また、識別マークを矩形にしたことで、マークの軸方向と周方向の長さを変えることによってのみ図形を用意でき、識別も容易なため、文字や記号のようにマークの方向を揃えなくても電線を識別することができ、機械による自動判別も可能となる。
【００１５】請求項３記載の発明は、請求項１又は２に記載の被覆電線であって、複数の前記識別マークを電線外周に等間隔の位置で付与することを特徴とする。
【００１６】この被覆電線では、前記識別マークを電線外周に等間隔の位置で付与することで、どの方向からでも容易に電線を識別することができる。
【００１７】
【実施の形態】以下、本発明の実施形態について説明する。
【００１８】＜第１実施形態＞図１は、本発明が用いられた第１実施形態の被覆電線１を示している。被覆電線１は、導体２と導体２を被覆する絶縁性の被覆部３とからなっている。被覆部３の外周表面の色としては、無色又は明度が高く彩度の低い白色や灰色等を用いる。被覆部３の外周面の軸方向に沿って、識別マーク４、識別マーク５を電線全体に印刷する。識別マーク４、５は、矩形状で、被覆部３の地色と色彩の異なる色で、かつ、互いに色と軸方向の長さが異なる。識別マーク４、５色の組み合わせは、黒と黄色や、補色関係にある２色、例えば青と黄赤、赤と青緑、黄と青紫等、互いを目立たせる色を選択する。識別マーク４、５の軸方向の長さＬ１、Ｌ３については、Ｌ３はＬ１の２倍以上の長さに設定する。また、識別マーク４と識別マーク５との間Ｌ２の長さは、識別マーク４の長さＬ１の１／２からＬ１の長さまでとする。
【００１９】このような構成にすることで、識別マーク４、５は彩度の低い色に囲まれた状態となり、識別マーク自体が際立ち、識別しやすい。また、識別マーク５は軸方向の長さＬ３が識別マーク４の軸方向の長さＬ１より長いため、より際立って見え、高い識別性を備える電線となる。このため、識別マークの色は最低２色あれば良く、従来のように、多数の色を用意しなくても、少ない色数で電線に情報を付与することができる。また、識別マークを矩形にしたことで、マークの軸方向と周方向の長さを変えることによってのみ図形を用意でき、識別も容易なため、文字や記号のようにマークの方向を揃えなくても電線を識別することができ、機械による自動判別も可能となり、作業性を向上させることができる。
【００２０】また、識別マークを電線全体に断続的に、更に、電線外周に等間隔の位置で付与することで、どの方向からでも容易に電線を識別することができる。更に、識別マークの最初の表示位置を、それ以降の表示位置間隔と統一しないことにより、電線のどの位置からでも電線識別情報を視認でき、使用できる。また、電線の起点を揃える必要がないため、作業の軽減化に繋がるという効果が期待できる。
【００２１】以上の被覆電線では、回路の増加に併せて、識別用に多数の異なる色を用意する必要がないため、製造ラインにおいて各色に対応する部材を増やす必要もない。また、電線が長かったり、枝分かれ等で形状が複雑な場合でも、電線全体に識別マークが付与されているため、各電線の情報の視認性等は損なわれることがない。更に、本発明の高い識別性により、線径が細い場合でも、容易に識別が可能であるため、配線作業の際、誤認識や誤装着、誤組み付けを防止できる。その結果、作業効率が上がり、作業コストの減少に繋がる。
【００２２】なお、電線端末６から最初に付与する識別マーク４までの距離Ｌ０は、端子との接続で隠れない位置が好ましく、端子と接続しない場合には、端末から形成しても良い。
【００２３】＜第２実施形態＞図２は、本発明が用いられた第２実施形態の被覆電線１１を示している。被覆電線１１は、導体１２と導体１２を被覆する絶縁性の被覆部１３とからなっている。被覆部１３の外周表面の色としては、第１実施形態と同様、無色又は明度が高く彩度の低い白色や灰色等を用いる。被覆部１３の外周面の軸方向に沿って、識別マーク１４、識別マーク１５を印刷

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する。識別マーク１４、１５は、第１実施形態と同様矩形状で、被覆部１３の地色と色彩の異なる色で、かつ、互いに色と軸方向と周方向の長さが異なる。識別マーク１４、１５の形状は軸方向の長さＬ１、Ｌ３については第１実施形態と同様に設定し、周方向の長さＬ４、Ｌ５については、Ｌ４がＬ５より長くなるように設定する。識別マーク１４、１５の色の組み合わせは、第１実施形態と同様、互いを目立たせる色を選択する。以上のように、識別マーク１４、１５は、色の組み合わせと、識別マークの形状が軸方向の長さのみならず、周方向の長さも互いに異なるように設定することで、識別マーク１４、１５両方のマークが際立つ。

【００２４】以上のように構成にすることで、識別マーク１４、１５自体が際立つため、識別しやすい。また軸方向のみならず、外周方向の長さも互いに異なることから、更に多くの情報を識別マークに付与することができる。よって、更に電線の識別性が向上し、線径が細い場合でも、容易に識別が可能である。

【００２５】

【発明の効果】以上説明したように請求項１の発明によれば、この被覆電線では、電線地色を無色又は明度が高く彩度の低い白色、灰色等を用いることで、識別マークを際だたせる効果を持つ。また、電線地色を識別マークの間に必ず配置することで、識別マークは彩度の低い色に囲まれた状態となり、識別マークの彩度が上がり、更に識別性が向上する。更に、識別マークの色の組み合わせを互いを目立たせるような色を選択し、例えば補色関係にある色を選択することで更に識別性が向上する。また、識別マークを、表示間隔を一定にして断続的に配列させたことで、識別マークの表示位置間隔が統一され、その結果、電線のどの位置を採用しても電線サイズや電線種を視認でき、また、電線の起点を揃える必要がない。

【００２６】以上により、従来のように、多数の色やマークを用意しなくても、電線に多くの情報を付与することができる。また、電線が高い識別性を有することにより、線径が細い場合でも、容易に識別が可能であるため、配線作業の際、誤認識や誤装着、誤組み付けを防止できる。その結果、作業効率が向上することから作業コストの減少に繋がる。よって、電線が細くても容易に識別でき、電線の組み立て、配線等の作業性を向上させる被覆電線を提供することが可能となる。

【００２７】請求項２の発明によれば、識別マークの大きさを変える事で、どちらか一方もしくは全ての識別マークを際立たせることができるため、識別性が向上する。また、識別マークを矩形にしたことで、マークの軸方向と周方向の長さを変えることによってのみ形状を区別でき、文字や記号のように、方向を揃えなくてもマークを識別することができ、機械による自動判別も可能となる。

【００２８】請求項３の発明によれば、この被覆電線では、前記識別マークを電線外周に等間隔の位置で付与することで、どの方向からでも容易に電線を識別することができる。

【図面の簡単な説明】

【図１】この発明に係る一実施例を示す正面図である。

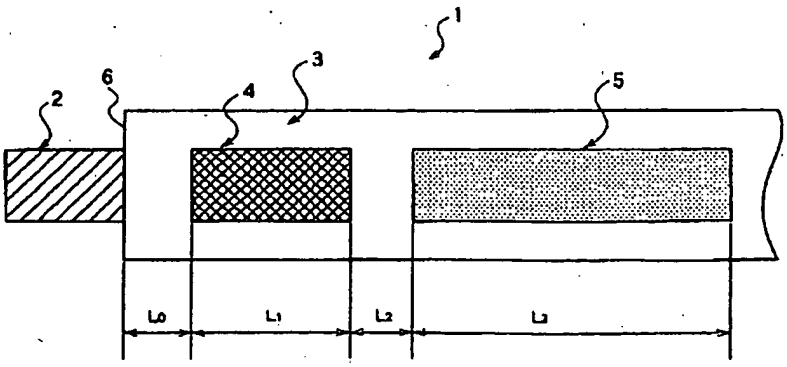
【図２】他の実施例を示す正面図である。

【図３】従来図を示す正面図である。

【符号の説明】

１、１１、２１	被覆電線
１２、２２、３２	導体
１３、２３、３３	絶縁体地色（被覆部）
１４、２４	識別マークａ
１５、２５	識別マークｂ
１６、２６	電線端部
Ｌ１	識別マークａ軸方向寸法
Ｌ２	識別マーク離間寸法
Ｌ３	識別マークｂ軸方向寸法
Ｌ４	識別マークａ周方向寸法
Ｌ５	識別マークｂ周方向寸法
２４	ストライプ

【図１】



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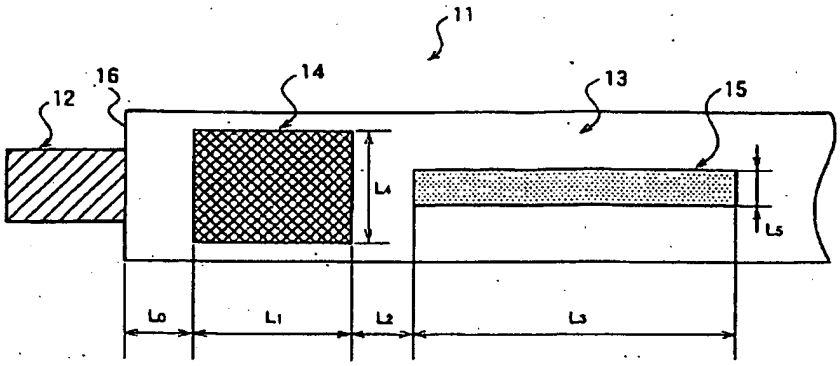
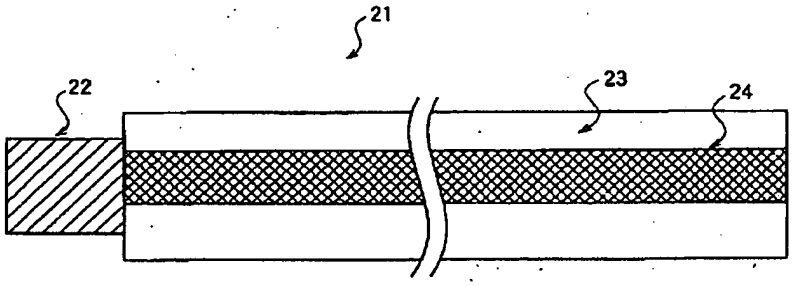
【図２】



【図３】



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CLAIMS

[Claim(s)]
[Claim 1] The cable characterized by a display interval making the identification marking of two or more colors from which the ground color which is identifiable and meets the shaft orientations of a cable in electric-wire identification information in the cable which constitutes the wire harness for electrical circuit connection, and color differ arrange intermittently uniformly with an electric-wire terminal as the starting point.
[Claim 2] The cable characterized by being a cable according to claim 1, and for said identification marking consisting of two or more sorts of rectangles from which magnitude differs, and identifying an electric-wire kind by the combination and its order of an array of said identification marking.
[Claim 3] The cable which is a cable according to claim 1 or 2, and is characterized by giving said two or more identification marking to an electric-wire periphery in a location at equal intervals.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the cable which gave the identification marking for identifying the electric-wire size and the electric-wire kind of the cable used for wire harness etc.
[0002]
[Description of the Prior Art] When connecting with electronic autoparts, the mark was given to each pre-insulation electric wire which constitutes wire harness until now in order to identify the electric wire corresponding to each electrical circuit. How to change a color for ** each electric wire of every, and consider as a mark as an approach of putting a mark. ** How to attach a marking tube or a marking tape in each electric wire, and consider as a mark like a cable given in the JP,7-254313,A official report shown in drawing 3 . ** The method of printing a circuit name and a circuit number on each electric wire directly in an alphabetic character or a figure using marking equipment etc. is proposed. By such mark, electric-wire classification and electric-wire size were recognized.
[0003] There is a problem shown below by the discernment approach of the above-mentioned electric wire. ** When changing a color for each [are shown] electric wire of every and considering as a mark, the electric wire with which the colors of a cladding material differ to each circuit must be prepared. For this reason, since the class of electric wire will also increase and the tooth spaces for making the electric wire with which the colors of the member for manufacture and a cladding material differ in a production line stand by will increase in number if a circuit increases, it becomes the cause to which management cost increases.
[0004] Next, when attaching a marking tube or a marking tape in each electric wire shown in ** and considering as a mark, members, such as a marking tube and a tape, are needed and it leads to the cost rise of a product. Moreover, for the purpose of lightweight-izing, although, as for the wire harness for electrical circuit connection, the electric wire of various sizes is used, since an electric wire tends to be narrow-diameter-ized, many especially electric wires of less than 0.5 sqs are used. In this case, although 2 or 3 sorts of colors are used for circuit discernment, visibility falls with narrow-diameter-izing, epicritic falls extremely depending on the combination of a color, and incorrect recognition and incorrect attachment become easy to take place.
[0005] Furthermore, since the electric wire itself is manufactured at high speed when printing directly a circuit name [which is shown in **], and circuit number on each electric wire in an alphabetic character or a figure using marking equipment, if a part of shake and printing separate [each electric wire] from an electric wire in vibration of a cleat roll etc., since it will be printed in a form with imperfect alphabetic character and figure, reading becomes impossible, and it becomes the cause of a discernment mistake. A problem as shown above leads to decline in wiring working efficiency, and causes increase of activity cost.
[0006] Then, the discernment approach aiming at offering the simple marking specification which can identify a circuit correctly is proposed, without increasing a manufacturing cost in the wire harness of a publication using existing marking equipment in a JP,11-27817,A official report. The discernment approach of an official report carries out marking of the band 1 of predetermined width of face in the direction which crosses each electric wire as a graphic form of a unit, makes "1" correspond to the band 1 as a numeric value of a unit, and is making the circuit number correspond to the numeric value computed by the number of the bands 1, as shown in an official report at drawing 1 (a) of a publication.
[0007] When it expresses a large numeric value with this discernment approach, "5" is made to

correspond to the band 11 thicker than the thin band 1 in which the above "1" is shown as a numeric value of a unit, and a figure is shown combining this thick band 11 and the thin band 1. as a graphic form of a unit, it is shown not only in a "band" but in drawing 1 (b) -- as -- "black dot" 2 grade -- even if an electric wire shakes by mechanical vibration etc., printing shifts in the case of printing and marking of each notation is imperfectly performed by making it a simple thing, if it does not print completely, unlike the case where semantics is not understood, recognition of the graphic form configuration and grasp of the number can be performed like the usual figure or the alphabetic character itself. Moreover, since a graphic form can carry out marking small, the wire harness made to correspond to each circuit is discriminable with the number and the order of an array of a graphic form.

[0008] In order to carry out marking of the graphic form of a simple configuration and to identify each electric wire with that number, it is not necessary to recognize itself clearly, therefore to perform marking to a precision like the usual figure or an alphabetic character, in this invention. Moreover, it is not necessary to use the electric wire with which colors differ for every circuit, and the electric wire of a color common to all electric wires can be used.

[0009]

[Problem(s) to be Solved by the Invention] However, in the case of the thin electric wire of less than 0.5 sqs, since it will be hard to check by looking if marking is Isshiki, discernment is difficult. Moreover, in order to identify an electric wire with the number of marking of a graphic form, the first display positions near the connector which is a connection about the part of marking etc., and the configuration of a mark must be specified. Moreover, when a configuration is complicated, even if it is long, or the electric-wire section of wire harness carries out marking also to the die-length direction pars intermedia of an electric wire by branching etc., an electric wire can twist on the way, or it goes out, and when it is the middle of the part being marking, discernment of the electric wire becomes difficult. Therefore, the visibility of the information on each electric wire may be spoiled.

[0010] Then, this invention can be easily identified, even if an electric wire is thin, and it aims at offer of the cable which raises the workability of the assembly of an electric wire, wiring, etc.

[0011]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, invention according to claim 1 is characterized by a display interval making the identification marking of two or more colors from which the ground color which is identifiable and meets the shaft orientations of a cable, and color differ electric-wire identification information arrange intermittently uniformly with an electric-wire terminal as the starting point in the cable which constitutes the wire harness for electrical circuit connection.

[0012] it is about identification marking in the case in using an electric-wire ground color for colorlessness or white with low saturation with high lightness, gray, etc. in this cable -- ****** -- things are made. Moreover, by surely arranging an electric-wire ground color between identification marking, it will be in the condition of having been surrounded by the color with low saturation, the identification marking itself is conspicuous, and epicritic [identification marking's] improves. Furthermore, epicritic [selection's of the combination of the color of identification marking] improves further by choosing the color which considers as a color which highlights each, for example, has a complementary color relation. Moreover, the display interval of identification marking is fixed, and display-position spacing of identification marking needs to be unified by making it arrange intermittently, electric-wire size and an electric-wire kind can be checked by looking from every location of an electric wire, and it is not necessary to arrange the origin of an electric wire.

[0013] Invention according to claim 2 is a cable according to claim 1, and said identification marking consists of two or more sorts of rectangles from which magnitude differs, and it is characterized by an electric-wire kind being discriminable with the combination and its order of an array of a configuration of said identification marking.

[0014] In this cable, since either or all identification marking can be made conspicuous for changing the magnitude of said identification marking, epicritic improves. Moreover, by having made identification marking into the rectangle, a graphic form can be prepared only by changing the die length of the shaft orientations of a mark, and a hoop direction, since discernment is also easy, even if it does not arrange the direction of a mark like an alphabetic character or a notation, an electric wire can be identified, and the automatic distinction by the machine is also attained.

[0015] Invention according to claim 3 is a cable according to claim 1 or 2, and is characterized by giving said two or more identification marking to an electric-wire periphery in a location at equal intervals.

[0016] An electric wire is easily discriminable from every direction with this cable by giving said identification marking to an electric-wire periphery in a location at equal intervals.
[0017]
[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained.
[0018] <1st operation gestalt> drawing 1 shows the cable 1 of the 1st operation gestalt with which this invention was used. The cable 1 consists of the insulating covering section 3 which covers a conductor 2 and a conductor 2. As a color on the front face of a periphery of the covering section 3, colorlessness or lightness uses white, gray, etc. with saturation it is high and low. In accordance with the shaft orientations of the peripheral face of the covering section 3, identification marking 4 and identification marking 5 are printed on the whole electric wire. Identification marking 4 and 5 is a rectangle-like, and it is the color from which the ground color of the covering section 3 and color differ, and a color differs from the die length of shaft orientations mutually. The combination of identification marking 4 and five colors chooses the color which highlights each for black, yellow and two colors that have a complementary color relation, for example, blue, yellowy red and red, bluish green and yellow, purple-blue, etc. About the die length L1 and L3 of the shaft orientations of identification marking 4 and 5, L3 is set as the twice [more than] as many die length of L1 as this. Moreover, die length between [L2] identification marking 4 and identification marking 5 is carried out to to the die length of 1/2 to L1 of the die length L1 of identification marking 4.
[0019] It will be in the condition of having been surrounded by the color with low saturation, the identification marking itself is conspicuous, and it is easy to identify identification marking 4 and 5 by making it such a configuration. Moreover, since identification marking 5 has the die length L3 of shaft orientations longer than the die length L1 of the shaft orientations of identification marking 4, it is more conspicuous, is visible and serves as an electric wire equipped with epicritic [high]. For this reason, at least 2 ******** of the color of identification marking are good, and like before, even if it does not prepare many colors, it can give information to an electric wire with the small color number. Moreover, a graphic form can be prepared only by changing the die length of the shaft orientations of a mark, and a hoop direction, and by having made identification marking into the rectangle, since discernment is also easy, even if it does not arrange the direction of a mark like an alphabetic character or a notation, an electric wire is discriminable, and the automatic distinction by the machine can also become possible and can raise workability.
[0020] Moreover, an electric wire is easily discriminable from every direction by giving identification marking intermittent further to an electric-wire periphery in a location at equal intervals at the whole electric wire. Furthermore, by not unifying the display position of the beginning of identification marking with display-position spacing after it, from every location of an electric wire, electric-wire identification information can be checked by looking and it can be used. Moreover, since it is not necessary to arrange the origin of an electric wire, the effectiveness of leading to mitigation-ization of an activity is expectable.
[0021] In the above cable, it combines with the increment in a circuit, and since it is not necessary to prepare the color from which a large number differ in discernment, it is not necessary to increase the member corresponding to each color in a production line. Moreover, since an electric wire is long, or identification marking is given to the whole electric wire by branching etc. even when a configuration is complicated, the visibility of the information on each electric wire etc. is not spoiled. Furthermore, by epicritic [of this invention / high], even when a wire size is thin, since it is discriminable, in case it is a wiring activity, incorrect recognition, incorrect wearing, and incorrect attachment can be prevented easily. Consequently, working efficiency increases and it leads to reduction of activity cost.
[0022] In addition, the distance L0 to the identification marking 4 given to the beginning from the electric-wire terminal 6 has the desirable location in which it does not hide by connection with a terminal, and when not connecting with a terminal, it may be formed from a terminal.
[0023] <2nd operation gestalt> drawing 2 shows the cable 11 of the 2nd operation gestalt with which this invention was used. The cable 11 consists of the insulating covering section 13 which covers a conductor 12 and a conductor 12. As a color on the front face of a periphery of the covering section 13, colorlessness or lightness as well as the 1st operation gestalt uses white, gray, etc. with saturation it is high and low. In accordance with the shaft orientations of the peripheral face of the covering section 13, identification marking 14 and identification marking 15 are printed. Identification marking 14 and 15 is a rectangle-like like the 1st operation gestalt, and it is the color from which the ground color of the covering section 13 and color differ, and the die length of a color, shaft orientations, and a hoop

direction differs mutually. The configuration of identification marking 14 and 15 is set up like [die length / L1 and L3 / of shaft orientations] the 1st operation gestalt, and about the die length L4 and L5 of a hoop direction, it is set up so that L4 may become longer than L5. The combination of the color of identification marking 14 and 15 chooses the color which highlights each like the 1st operation gestalt. As mentioned above, the combination of a color and the configuration of identification marking not only of the die length of shaft orientations but the die length of a hoop direction are setting up so that it may differ mutually, and, as for identification marking 14 and 15, identification marking 14 and the mark of 15 both are conspicuous.

[0024] Since identification marking 14 and 15 the very thing are conspicuous for making it a configuration as mentioned above, it is easy to identify. Moreover, further much information can be given to identification marking from not only shaft orientations but periphery lay length differing mutually. Therefore, epicritic [of an electric wire] improves further, and even when a wire size is thin, it can identify easily.

[0025]

[Effect of the Invention] as explained above, according to invention of claim 1, it is about identification marking in the case in using an electric-wire ground color for colorlessness or white with low saturation with high lightness, gray, etc. in this cable -- it has the ****** effectiveness. Moreover, it will be in the condition of having been surrounded by the color with low saturation, the saturation of identification marking goes up by surely arranging an electric-wire ground color between identification marking, and epicritic [identification marking's] improves further by it. Furthermore, epicritic improves further by choosing the color which chooses a color as for which the combination of the color of identification marking highlights each, for example, has a complementary color relation. Moreover, by having fixed the display interval and having made identification marking arrange intermittently, even if display-position spacing of identification marking is unified, consequently it adopts which location of an electric wire, electric-wire size and an electric-wire kind can be checked by looking, and it is not necessary to arrange the origin of an electric wire.

[0026] By the above, like before, even if it does not prepare much colors or marks, much information can be given to an electric wire. Moreover, in case it is a wiring activity easily by having epicritic [with an expensive electric wire] since it is discriminable even when a wire size is thin, incorrect recognition, incorrect wearing, and incorrect attachment can be prevented. Consequently, since working efficiency improves, it leads to reduction of activity cost. Therefore, even if an electric wire is thin, it can identify easily, and it becomes possible to offer the cable which raises the workability of the assembly of an electric wire, wiring, etc.

[0027] Since either or all identification marking can be made conspicuous for changing the magnitude of identification marking according to invention of claim 2, epicritic improves. Moreover, by having made identification marking into the rectangle, like an alphabetic character or a notation, a configuration is distinguishable only by changing the die length of the shaft orientations of a mark, and a hoop direction, and even if it does not arrange a direction, a mark can be identified, and the automatic distinction by the machine is also attained.

[0028] According to invention of claim 3, an electric wire is easily discriminable from every direction with this cable by giving said identification marking to an electric-wire periphery in a location at equal intervals.

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TECHNICAL FIELD

[Field of the Invention] This invention relates to the cable which gave the identification marking for identifying the electric-wire size and the electric-wire kind of the cable used for wire harness etc.

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PRIOR ART

[Description of the Prior Art] When connecting with electronic autoparts, the mark was given to each pre-insulation electric wire which constitutes wire harness until now in order to identify the electric wire corresponding to each electrical circuit. How to change a color for ** each electric wire of every, and consider as a mark as an approach of putting a mark. ** How to attach a marking tube or a marking tape in each electric wire, and consider as a mark like a cable given in the JP,7-254313,A official report shown in drawing 3 . ** The method of printing a circuit name and a circuit number on each electric wire directly in an alphabetic character or a figure using marking equipment etc. is proposed. By such mark, electric-wire classification and electric-wire size were recognized.
[0003] There is a problem shown below by the discernment approach of the above-mentioned electric wire. ** When changing a color for each [are shown] electric wire of every and considering as a mark, the electric wire with which the colors of a cladding material differ to each circuit must be prepared. For this reason, since the class of electric wire will also increase and the tooth spaces for making the electric wire with which the colors of the member for manufacture and a cladding material differ in a production line stand by will increase in number if a circuit increases, it becomes the cause to which management cost increases.
[0004] Next, when attaching a marking tube or a marking tape in each electric wire shown in ** and considering as a mark, members, such as a marking tube and a tape, are needed and it leads to the cost rise of a product. Moreover, for the purpose of lightweight-izing, although, as for the wire harness for electrical circuit connection, the electric wire of various sizes is used, since an electric wire tends to be narrow-diameter-ized, many especially electric wires of less than 0.5 sqs are used. In this case, although 2 or 3 sorts of colors are used for circuit discernment, visibility falls with narrow-diameter-izing, epicritic falls extremely depending on the combination of a color, and incorrect recognition and incorrect attachment become easy to take place.
[0005] Furthermore, since the electric wire itself is manufactured at high speed when printing directly a circuit name [which is shown in **], and circuit number on each electric wire in an alphabetic character or a figure using marking equipment, if a part of shake and printing separate [each electric wire] from an electric wire in vibration of a cleat roll etc., since it will be printed in a form with imperfect alphabetic character and figure, reading becomes impossible, and it becomes the cause of a discernment mistake. A problem as shown above leads to decline in wiring working efficiency, and causes increase of activity cost.
[0006] Then, the discernment approach aiming at offering the simple marking specification which can identify a circuit correctly is proposed, without increasing a manufacturing cost in the wire harness of a publication using existing marking equipment in a JP,11-27817,A official report. The discernment approach of an official report carries out marking of the band 1 of predetermined width of face in the direction which crosses each electric wire as a graphic form of a unit, makes "1" correspond to the band 1 as a numeric value of a unit, and is making the circuit number correspond to the numeric value computed by the number of the bands 1, as shown in an official report at drawing 1 (a) of a publication.
[0007] When it expresses a large numeric value with this discernment approach, "5" is made to correspond to the band 11 thicker than the thin band 1 in which the above "1" is shown as a numeric value of a unit, and a figure is shown combining this thick band 11 and the thin band 1. as a graphic form of a unit, it is shown not only in a "band" but in drawing 1 (b) -- as -- "black dot" 2 grade -- even if an electric wire shakes by mechanical vibration etc., printing shifts in the case of printing and marking of each notation is imperfectly performed by making it a simple thing, if it does not print completely,

unlike the case where semantics is not understood, recognition of the graphic form configuration and grasp of the number can be performed like the usual figure or the alphabetic character itself. Moreover, since a graphic form can carry out marking small, the wire harness made to correspond to each circuit is discriminable with the number and the order of an array of a graphic form.

[0008] In order to carry out marking of the graphic form of a simple configuration and to identify each electric wire with that number, it is not necessary to recognize itself clearly, therefore to perform marking to a precision like the usual figure or an alphabetic character, in this invention. Moreover, it is not necessary to use the electric wire with which colors differ for every circuit, and the electric wire of a color common to all electric wires can be used.

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EFFECT OF THE INVENTION

[Effect of the Invention] as explained above, according to invention of claim 1, it is about identification marking in the case in using an electric-wire ground color for colorlessness or white with low saturation with high lightness, gray, etc. in this cable -- it has the ****** effectiveness. Moreover, it will be in the condition of having been surrounded by the color with low saturation, the saturation of identification marking goes up by surely arranging an electric-wire ground color between identification marking, and epicritic [identification marking's] improves further by it. Furthermore, epicritic improves further by choosing the color which chooses a color as for which the combination of the color of identification marking highlights each, for example, has a complementary color relation. Moreover, by having fixed the display interval and having made identification marking arrange intermittently, even if display-position spacing of identification marking is unified, consequently it adopts which location of an electric wire, electric-wire size and an electric-wire kind can be checked by looking, and it is not necessary to arrange the origin of an electric wire.
[0026] By the above, like before, even if it does not prepare much colors or marks, much information can be given to an electric wire. Moreover, in case it is a wiring activity easily by having epicritic [with an expensive electric wire] since it is discriminable even when a wire size is thin, incorrect recognition, incorrect wearing, and incorrect attachment can be prevented. Consequently, since working efficiency improves, it leads to reduction of activity cost. Therefore, even if an electric wire is thin, it can identify easily, and it becomes possible to offer the cable which raises the workability of the assembly of an electric wire, wiring, etc.
[0027] Since either or all identification marking can be made conspicuous for changing the magnitude of identification marking according to invention of claim 2, epicritic improves. Moreover, by having made identification marking into the rectangle, like an alphabetic character or a notation, a configuration is distinguishable only by changing the die length of the shaft orientations of a mark, and a hoop direction, and even if it does not arrange a direction, a mark can be identified, and the automatic distinction by the machine is also attained.
[0028] According to invention of claim 3, an electric wire is easily discriminable from every direction with this cable by giving said identification marking to an electric-wire periphery in a location at equal intervals.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the case of the thin electric wire of less than 0.5 sqs, since it will be hard to check by looking if marking is Isshiki, discernment is difficult. Moreover, in order to identify an electric wire with the number of marking of a graphic form, the first display positions near the connector which is a connection about the part of marking etc., and the configuration of a mark must be specified. Moreover, when a configuration is complicated, even if it is long, or the electric-wire section of wire harness carries out marking also to the die-length direction pars intermedia of an electric wire by branching etc., an electric wire can twist on the way, or it goes out, and when it is the middle of the part being marking, discernment of the electric wire becomes difficult. Therefore, the visibility of the information on each electric wire may be spoiled.
[0010] Then, this invention can be easily identified, even if an electric wire is thin, and it aims at offer of the cable which raises the workability of the assembly of an electric wire, wiring, etc.

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, invention according to claim 1 is characterized by a display interval making the identification marking of two or more colors from which the ground color which is identifiable and meets the shaft orientations of a cable, and color differ electric-wire identification information arrange intermittently uniformly with an electric-wire terminal as the starting point in the cable which constitutes the wire harness for electrical circuit connection.
[0012] it is about identification marking in the case in using an electric-wire ground color for colorlessness or white with low saturation with high lightness, gray, etc. in this cable -- ****** -- things are made. Moreover, by surely arranging an electric-wire ground color between identification marking, it will be in the condition of having been surrounded by the color with low saturation, the identification marking itself is conspicuous, and epicritic [identification marking's] improves. Furthermore, epicritic [selection's of the combination of the color of identification marking] improves further by choosing the color which considers as a color which highlights each, for example, has a complementary color relation. Moreover, the display interval of identification marking is fixed, and display-position spacing of identification marking needs to be unified by making it arrange intermittently, electric-wire size and an electric-wire kind can be checked by looking from every location of an electric wire, and it is not necessary to arrange the origin of an electric wire.
[0013] Invention according to claim 2 is a cable according to claim 1, and said identification marking consists of two or more sorts of rectangles from which magnitude differs, and it is characterized by an electric-wire kind being discriminable with the combination and its order of an array of a configuration of said identification marking.
[0014] In this cable, since either or all identification marking can be made conspicuous for changing the magnitude of said identification marking, epicritic improves. Moreover, by having made identification marking into the rectangle, a graphic form can be prepared only by changing the die length of the shaft orientations of a mark, and a hoop direction, since discernment is also easy, even if it does not arrange the direction of a mark like an alphabetic character or a notation, an electric wire can be identified, and the automatic distinction by the machine is also attained.
[0015] Invention according to claim 3 is a cable according to claim 1 or 2, and is characterized by giving said two or more identification marking to an electric-wire periphery in a location at equal intervals.
[0016] An electric wire is easily discriminable from every direction with this cable by giving said identification marking to an electric-wire periphery in a location at equal intervals.
[0017]
[Embodiment of the Invention] Hereafter, the operation gestalt of this invention is explained.
[0018] <1st operation gestalt> drawing 1 shows the cable 1 of the 1st operation gestalt with which this invention was used. The cable 1 consists of the insulating covering section 3 which covers a conductor 2 and a conductor 2. As a color on the front face of a periphery of the covering section 3, colorlessness or lightness uses white, gray, etc. with saturation it is high and low. In accordance with the shaft orientations of the peripheral face of the covering section 3, identification marking 4 and identification marking 5 are printed on the whole electric wire. Identification marking 4 and 5 is a rectangle-like, and it is the color from which the ground color of the covering section 3 and color differ, and a color differs from the die length of shaft orientations mutually. The combination of identification marking 4 and five colors chooses the color which highlights each for black, yellow and two colors that have a complementary color relation, for example, blue, yellowy red and red, bluish green and yellow, purple-

blue, etc. About the die length L1 and L3 of the shaft orientations of identification marking 4 and 5, L3 is set as the twice [more than] as many die length of L1 as this. Moreover, die length between [L2] identification marking 4 and identification marking 5 is carried out to to the die length of 1/2 to L1 of the die length L1 of identification marking 4.

[0019] It will be in the condition of having been surrounded by the color with low saturation, the identification marking itself is conspicuous, and it is easy to identify identification marking 4 and 5 by making it such a configuration. Moreover, since identification marking 5 has the die length L3 of shaft orientations longer than the die length L1 of the shaft orientations of identification marking 4, it is more conspicuous, is visible and serves as an electric wire equipped with epicritic [high]. For this reason, at least 2 ******** of the color of identification marking are good, and like before, even if it does not prepare many colors, it can give information to an electric wire with the small color number. Moreover, a graphic form can be prepared only by changing the die length of the shaft orientations of a mark, and a hoop direction, and by having made identification marking into the rectangle, since discernment is also easy, even if it does not arrange the direction of a mark like an alphabetic character or a notation, an electric wire is discriminable, and the automatic distinction by the machine can also become possible and can raise workability.

[0020] Moreover, an electric wire is easily discriminable from every direction by giving identification marking intermittent further to an electric-wire periphery in a location at equal intervals at the whole electric wire. Furthermore, by not unifying the display position of the beginning of identification marking with display-position spacing after it, from every location of an electric wire, electric-wire identification information can be checked by looking and it can be used. Moreover, since it is not necessary to arrange the origin of an electric wire, the effectiveness of leading to mitigation-ization of an activity is expectable.

[0021] In the above cable, it combines with the increment in a circuit, and since it is not necessary to prepare the color from which a large number differ in discernment, it is not necessary to increase the member corresponding to each color in a production line. Moreover, since an electric wire is long, or identification marking is given to the whole electric wire by branching etc. even when a configuration is complicated, the visibility of the information on each electric wire etc. is not spoiled. Furthermore, by epicritic [of this invention / high], even when a wire size is thin, since it is discriminable, in case it is a wiring activity, incorrect recognition, incorrect wearing, and incorrect attachment can be prevented easily. Consequently, working efficiency increases and it leads to reduction of activity cost.

[0022] In addition, the distance L0 to the identification marking 4 given to the beginning from the electric-wire terminal 6 has the desirable location in which it does not hide by connection with a terminal, and when not connecting with a terminal, it may be formed from a terminal.

[0023] <2nd operation gestalt> drawing 2 shows the cable 11 of the 2nd operation gestalt with which this invention was used. The cable 11 consists of the insulating covering section 13 which covers a conductor 12 and a conductor 12. As a color on the front face of a periphery of the covering section 13, colorlessness or lightness as well as the 1st operation gestalt uses white, gray, etc. with saturation it is high and low. In accordance with the shaft orientations of the peripheral face of the covering section 13, identification marking 14 and identification marking 15 are printed. Identification marking 14 and 15 is a rectangle-like like the 1st operation gestalt, and it is the color from which the ground color of the covering section 13 and color differ, and the die length of a color, shaft orientations, and a hoop direction differs mutually. The configuration of identification marking 14 and 15 is set up like [die length / L1 and L3 / of shaft orientations] the 1st operation gestalt, and about the die length L4 and L5 of a hoop direction, it is set up so that L4 may become longer than L5. The combination of the color of identification marking 14 and 15 chooses the color which highlights each like the 1st operation gestalt. As mentioned above, the combination of a color and the configuration of identification marking not only of the die length of shaft orientations but the die length of a hoop direction are setting up so that it may differ mutually, and, as for identification marking 14 and 15, identification marking 14 and the mark of 15 both are conspicuous.

[0024] Since identification marking 14 and 15 the very thing are conspicuous for making it a configuration as mentioned above, it is easy to identify. Moreover, further much information can be given to identification marking from not only shaft orientations but periphery lay length differing mutually. Therefore, epicritic [of an electric wire] improves further, and even when a wire size is thin, it can identify easily.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the front view showing one example concerning this invention.
[Drawing 2] It is the front view showing other examples.
[Drawing 3] It is the front view showing a Fig. conventionally.
[Description of Notations]
1, 11, 21 Cable
12, 22, 32 Conductor
13, 23, 33 Insulator ground color (covering section)
14 24 Identification marking a
15 25 Identification marking b
16 26 Electric-wire edge
L1 The direction dimension of an identification marking a-axis
L2 identification marking -- alienation -- dimension
L3 The direction dimension of an identification marking b-axis
L4 Identification marking a hoop direction dimension
L5 Identification marking b hoop direction dimension
24 Stripe

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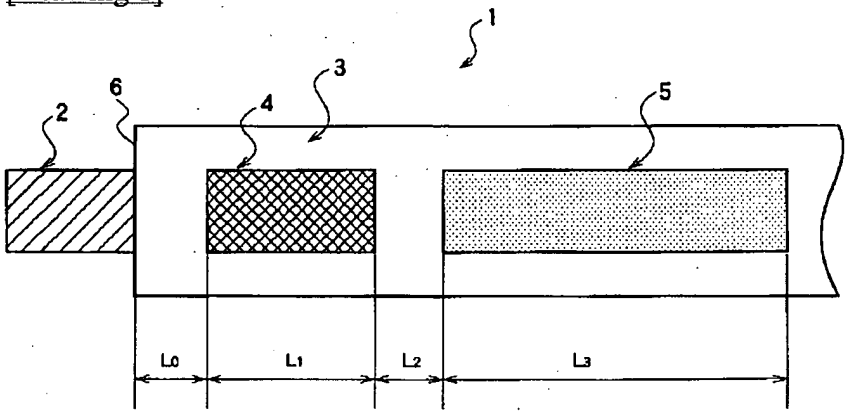
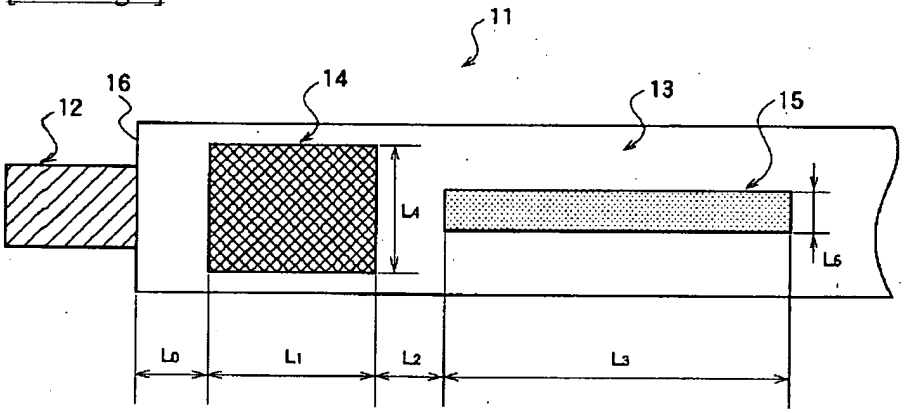
DRAWINGS

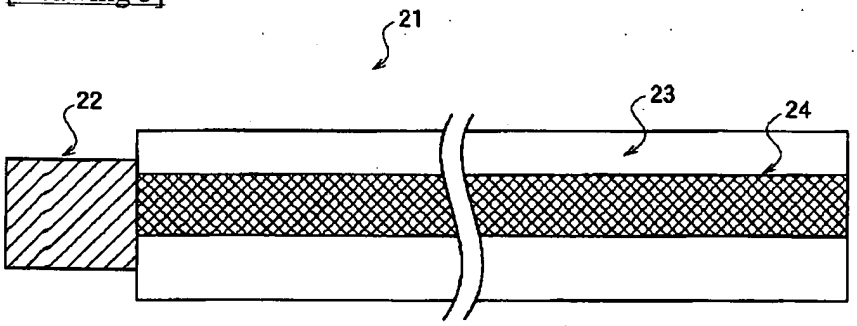
[Drawing 1]



[Drawing 2]



[Drawing 3]



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